IN THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1 – 11. Canceled.

12(Previously Presented). A method for adaptively controlling network traffic on a communications network with a shared communications medium comprising:

(1) determining traffic category permission probabilities;

(2) calculating an overall permission probability, *PP*;

(3) contending for access to the shared communications medium;

(4) determining updated traffic category permission probabilities; and

(5) repeating steps (2)-(4) until buffered traffic is transmitted

wherein there are a plurality of traffic categories, and a traffic category permission probability is assigned for each traffic category and the calculating an overall permission probability, PP, is a summation of the traffic category permission probabilities assigned to each traffic category.

13(Original). The method of claim 12, wherein determining traffic category permission probabilities comprises a centralized controller assigning the traffic category permission probabilities.

14(Original). The method of claim 12, wherein the shared communications medium is shared by a plurality of stations, and wherein determining traffic category permission probabilities comprises each station assigning the traffic category permission probabilities.

15 – 16. Canceled.

17(Original). The method of claim 12, wherein the shared communications medium is shared by a plurality of stations, and wherein the calculating overall permission probability step is performed by stations with traffic to transmit.

18(Original). The method of claim 12, wherein the contending for access step comprises:

determining if a contending station is permitted to transmit; and

sending traffic from an appropriate traffic category.

19(Original). The method of claim 18, wherein the determining step comprises:

generating a random number, X; and

granting the contending station permission to transmit only if the random number, X, is less than or equal to the overall permission probability, PP.

20(Original). The method of claim 18, wherein the sending traffic from an appropriate traffic category comprising sending traffic from traffic category N, where N meets the following criteria:

if $0 < X \leq TCPP_1$, then $N = 0$; else

$$\text{if } \sum_{i=0}^{M-1} TCPP_i < X \leq \sum_{i=0}^{M} TCPP_i \text{, then } N = M$$

where $TCPP_i$ is the traffic category permission probability for traffic category i and is set to zero if traffic category i has no traffic to send from the contending station.

21(Original). The method of claim 12, wherein the contending for access step comprises:

setting a backoff timer;

determining if a contending station can transmit; and

sending traffic from an appropriate traffic category.

22(Original). The method of claim 21, wherein the setting a backoff timer comprises:

generating a random number, X;

calculating a backoff time based on the random number, X; and

setting the backoff timer to the backoff time.

23(Original). The method of claim 22, wherein the calculating a backoff time uses the formula: $J = \lfloor \log(X)/\log(1-PP) \rfloor$, where $\lfloor Y \rfloor$ denotes a largest integer number not exceeding Y and PP is the overall permission probability.

24(Original). The method of claim 21, wherein the determining step comprises:

freezing a backoff timer when the shared communications medium is busy;

decrementing a backoff timer after the shared communications medium is idle for a point coordinating function inter-frame space period; and

waiting until the backoff timer expires.

25(Original). The method of claim 21, wherein the sending traffic from an appropriate traffic category comprising sending traffic from traffic category N, where N meets the criteria:

if $0 < C * X \le TCPP_1$, then $N = 0$; else

if $\sum_{i=0}^{M-1} TCPP_i < C * X \le \sum_{i=0}^{M} TCPP_i$, then $N = M$.

where $C = \sum_{i=0}^{Z} TCPP_i$, Z is a total number of traffic categories, and $TCPP_i$ is the traffic category transmission probability for traffic category i and is set to zero if traffic category i has no traffic to send from the contending station.

26(Original). The method of claim 12, wherein the determining updated traffic category permission probabilities step updates the traffic category permission probabilities by an amount that is proportional to how far a ratio of an amount of time the medium is in an idle state to an amount of time the medium is in a collision state is from optimal.

27(Original). The method of claim 12, wherein the determining updated traffic category permission probabilities occurs at regular fixed intervals of time.

28(Original). The method of claim 12, wherein the shared communications medium is shared by a plurality of stations, and wherein the determining traffic category updated traffic category permission probabilities is performed at each station with traffic to transmit.

29(Original). The method of claim 12, wherein the determining updated traffic category permission probabilities is performed at a centralized controller.

30(Original). The method of claim 12, wherein the determining updated traffic category permission probabilities step occurs at irregular time intervals and is triggered by a network performance metric.

31(Original). The method of claim 30, wherein the network performance metric is a ratio of an amount of time the medium is in an idle state to an amount of time the medium is in a collision state is outside of an interval (1 – *epsilon*, 1 + *epsilon*), where *epsilon* is a predetermined value.

32 – 53. Canceled.

54(Previously Presented). A method of data communication comprising:

determining a traffic category permission probability for each one of a plurality of traffic categories of data to be transmitted;

calculating an overall permission probability (PP) by summing traffic category permission probability of ach one of the traffic categories; and

transmitting data according to the overall permission probability.

55(Previously Presented). A method according to claim 54, further comprising:

determining whether the traffic category permission probability of one or more of the plurality of traffic categories has been updated; and

if the traffic category permission probability of one or more of the plurality of traffic categories has been updated, then

calculating updated permission probabilities; and

transmitting data using the updated permission probabilities.

56(Previously Presented). A method according to claim 54, wherein determining traffic category permission probabilities comprises assigning the traffic category permission probabilities to the plurality of traffic categories of data to be transmitted.

57(Previously Presented) A method according to claim 54, wherein the data is transmitted over a communication medium shared by a plurality of communication devices and determining traffic category permission probabilities comprises each device assigning the traffic category permission probabilities to corresponding plurality of traffic categories of data to be transmitted by each device.

58(Previously Presented). A method according to claim 57, wherein each device that has data to be transmitted calculates the overall permission probability.

59(Previously Presented). A method according to claim 57, wherein the transmitting data comprises:

determining whether a device is permitted to transmit data; and

if the device is permitted to transmit data, then

transmitting data from an appropriate traffic category.

60(Previously Presented). A method according to claim 59, wherein the determining step comprises:

generating a random number, X; and

granting the device permission to transmit data only if the random number, X, is less than or equal to the overall permission probability, PP.

61(Previously Presented). A communication device comprising:

means for determining a traffic category permission probability for each one of a plurality of traffic categories of data to be transmitted;

means for calculating an overall permission probability (PP) by summing traffic category permission probability of ach one of the traffic categories; and

means for transmitting data according to the overall permission probability.

62(Previously Presented). A communication device according to claim 61, further comprising:

means for determining whether the traffic category permission probability of one or more of the plurality of traffic categories has been updated;

means for calculating updated permission probabilities; and

means for transmitting data using the updated permission probabilities.

63(Previously Presented). A communication device according to claim 61, further comprising:

means for assigning the traffic category permission probabilities to the plurality of traffic categories of data to be transmitted.

64(Previously Presented). A communication device according to claim 61, further comprising:

means for determining whether a device is permitted to transmit data; and

means for transmitting data from an appropriate traffic category.

65(Previously Presented). A communication device according to claim 61, further comprising:

means for generating a random number, X; and

means for granting permission to the communication device to transmit data only if the random number, X, is less than or equal to the overall permission probability, PP.